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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/655,091	09/05/2000	Johann Meseth	GR 98 P 3112	8366

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EXAMINER	
AWAI, ALEXANDRA F	

ART UNIT	PAPER NUMBER
3663	

DATE MAILED: 11/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/655,091	MESETH, JOHANN	
	Examiner	Art Unit	
	Alexandra Awai	3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 November 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,7-10 and 15-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,7-10 and 15-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendments

1. In view of Applicant's request that claims 9 and 10 be rejoined, Examiner carefully considered the election/restriction requirement submitted 10/22/2001. The election/restriction requirement submitted 10/22/2001 has been withdrawn, and the supplementary amendment dated 11/9/2006 is acknowledged, in addition to the Remarks/Arguments filed 8/26/2006. Claims 1-4, 7-10 and new claims 15-20 are currently pending and have been examined.

Response to Arguments

2. Applicant's arguments filed 8/26/2006 have been fully considered but they are not persuasive. The amendments to claims 1 and 2 as shown in the amendments dated 8/26/2006 are acknowledged. According to Applicant, the claims are patentable over Gluntz et al. because the basic structure of the overall condenser system according to Gluntz et al. precludes interference with the operation of the condenser from noncondensable gases. However, the fact that Gluntz et al. provide active gas separators to provide improved operation of the condensers – which Examiner acknowledged on page 3 of the Office action dated 5/26/2006 – is not evidence that "an interference of the operation of the condenser by the noncondensable gases cannot at all occur" (Remarks/Arguments, p. 10/12). In fact, it is evidence that noncondensable gases do enter the flow path between the pressure chamber and the condenser, and that skilled artisans are aware that these gases are detrimental to condenser operation.

Applicant attempts to contrast the system of the present invention with the system disclosed by Gluntz et al. by asserting that the condenser system according to Gluntz et al. has a condenser outside of the actual containment, whereas in the invention of the instant application the condenser is positioned inside of the containment vessel. However, the system disclosed by Gluntz et al. is equivalent to the first embodiment of the invention, and therefore the teachings of Gluntz et al. are justifiably applicable in an obviousness rejection. As stated in the Summary of the Invention:

> "The two embodiments are based on the common inventive concept of ensuring a high efficiency of the condenser by preventing noncondensible gases from coming into contact with the condenser in too high a concentration. In principle, the condenser may be disposed both inside and outside the pressure chamber. If it is disposed outside the pressure chamber, superheated steam is directed to it through a flow path from the top region of the pressure chamber. In the first embodiment, the noncondensible gases are drawn off beforehand from the top region of the pressure chamber through the drain pipe into the condensing chamber. In the case of a condenser disposed inside the pressure chamber, provision is made in the second embodiment for the noncondensible gases to be drawn off directly from the surroundings of the condenser through the use of the drain pipe. In this case, the condenser is disposed in particular in the top region of the pressure chamber" (specification, p. 6).

In both embodiments of the present invention, noncondensable gases are removed from the flow path leading to the condenser in order that they do not interfere with condenser function. This is the stated common inventive concept of the embodiments. The location of the condenser is largely irrelevant in view of the fact that the condenser is always in fluid communication with condensable and noncondensable gases from the pressure chamber, as well as with the cooling basin. Applicant even states that the condenser may be disposed both inside and outside the pressure chamber, and provides no enabling guidance for manufacturing this aspect of the invention. This fact, along with the absence of a figure demonstrating the first embodiment, is a tacit admission that the first and second embodiments are obvious variants that are based on a

common inventive concept. Additionally, Applicant erroneously concludes that the noncondensable gases are targetedly led away through the pipe 68 in the cited reference. In fact, item 68 is a condensate return conduit.

Accordingly, the assertion that the present invention is "a design that is opposite" compared with the cited art is misleading. In both embodiments of the instant application, as well as the system of the cited reference, the object is to consider the noncondensable gas in the design from the very beginning, and to prevent it from reaching the internals of the condenser. In both the reference and the instant application, the medium to be cooled and condensed, namely the containment atmosphere, flows within the containment freely until entering the heat-exchanger tubes that define the condenser, or conduits that lead directly to these tubes. Where the condenser is located in the cooling basin – as in the first embodiment – it is simply in fluid communication with the pressure chamber through relatively longer conduits than are utilized in the second embodiment. This construction is so obvious to the skilled artisan that Applicant merely states the principle of disposing the condenser according to either embodiment (e.g., specification, p. 14). The relevant difference between the system of the cited reference and the claimed embodiment is that the pipe leading to the lower condensing chamber of Gluntz et al. does not have an upper end disposed at a level above said condenser. This difference is accounted for by widely available knowledge as well as teachings regarding the behavior and dangers of noncondensable gases found in Gluntz et al. in the rejection of the previous Office action.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 17-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. More specifically, claims 17-20 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are those means that enable the automatic drawing off of the noncondensable gases, and the directing steps of claims 18-20. The method claims should provide proper antecedent basis – in the preamble, for example – for any features that are not inherent to any conceivable method of operating a condenser in a nuclear power plant as claimed.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-4, 7-10 and 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gluntz et al. (5,596,613).

Gluntz et al. disclose a pressure suppression containment system for a boiling water reactor comprising an interior space (20), a condensing chamber (22) disposed within and filled

with coolant (24), a pressure chamber having a top region, a condenser (54) in fluid communication with the pressure chamber, and a multiplicity of vertical flow channels (27) that function as both condensing pipes for steam and drain pipes for noncondensable gas. Note that the entry of noncondensable gas into the condensing pipe, or of condensable gas into the drain pipe of the instant invention is unavoidable as well. These vertical flow channels are permanently open flow paths that define a direct connection to the condensing chamber without being connected to the condenser. Their bottom ends are immersed in the coolant of the condensing chamber. The condenser fluidically communicates with the cooling basin (52), which is external to the pressure chamber and open to the atmosphere via vents (58).

The system is configured to transport the noncondensable gas from the pressure chamber to the condensing chamber plenum and actively condense steam from the drywell in the condenser, as well as to passively remove steam and noncondensable gas into the condensing chamber. The second embodiment as set forth in claim 2 – wherein the condenser is in the pressure chamber – is an obvious variant of the first embodiment as discussed in section 2 of this Office action. It is within the purview of the skilled artisan to apply the teachings of Gluntz et al. to this slightly modified known (with regard to the condenser structure/location) system.

It is a well known fact that noncondensable gases of particular interest in the nuclear field (e.g., hydrogen and nitrogen) are more buoyant than water vapor, leading them to rise and accumulate in relatively higher concentration at the top of the interior space/pressure chamber and thus around the condenser and/or condenser inlet. It is also commonly understood that noncondensable gas from the interior space must be separated from the steam to provide effective operation of condensers (col. 2, lines 57-61). In the absence of active gas separators as

provided in the referenced art, or in addition to them to provide redundancy and increase system productivity, passive means such as the flow channels (27) may be used to remove the noncondensable gas (30) and thus improve suppression system performance.

It would have been obvious to one skilled in the art at the time of invention to modify the flow channels disclosed by Gluntz et al. so that their openings would be above the condenser or condenser inlet in order to use those modified flow channels to advantageously siphon relatively more noncondensable gas than steam into the condensing chamber according to well-known scientific phenomena and knowledge commonly available in the art, i.e., configuring them as drain pipes in accordance with claims 1 and 2. Alternatively, it would have been obvious to use a system such as the passive noncondensable gas-removal system defined by the flow channels (27), condensing chamber (22) and coolant (24) disclosed by Gluntz et al. in the region around and above the condenser (54) inlet, as such is no more than the advantageous application of a well known expedient in the art. The motivation to install the system in this way would have been to use a known passive system to augment the active gas separators or serve as a backup to those separators, thus ensuring optimal performance of the condenser.

Gluntz et al. teach that noncondensable gas (30) siphoned into the condensing chamber is buoyed upwardly through the pool water into the condensing chamber air space disposed above the filling level (col. 3, lines 3-23). This is proof of the widespread understanding of noncondensable gas behavior and a motivation for modifying those flow channels that are *not* configured to siphon relatively more noncondensable gas than steam into the condensing chamber, but rather are configured as condensing pipes. That is, it would have been obvious to one skilled in the art at the time of invention to configure the ends of the flow channels

functioning as condensing pipes to be below the ends of the drain pipes in order that the buoyant noncondensable gas being siphoned into the condensing chamber by the drain pipes be prevented from floating back into the interior space via the condensing pipes. Instead, the noncondensable gas would be advantageously retained in the condensing chamber plenum where it would not adversely affect condenser operation. The strategic positioning of pipe ends is commonly understood by the skilled artisan, and is no more than an obvious optimization within prior art conditions, the result-dependent variable being the retention of noncondensable gases (MPEP § 2144.05.II). Thus, by applying only known technology (i.e., installing/altering pipes) in accordance with only commonly understood principles (i.e., thermodynamics of real systems), in an obvious manner, the system disclosed by the prior art may be made to function more effectively in the passive mode, thereby increasing safety.

As is clear from the foregoing discussion, the steps set forth in claims 17-20 are encompassed by making and using the system disclosed by Gluntz et al. (MPEP § 2112.02). The various limitations regarding directing the noncondensable gases are automatically accomplished by installing the flow channels as discussed above, and are encompassed by the normal functioning of the obvious passive system. The automatic nature of these steps directly follows from the inevitable behavior of the noncondensable gases themselves.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexandra Awai whose telephone number is (571) 272-3079. The examiner can normally be reached on 9:30-6:00 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AA
November 11, 2006

JACK KEITH
SUPERVISORY PATENT EXAMINER